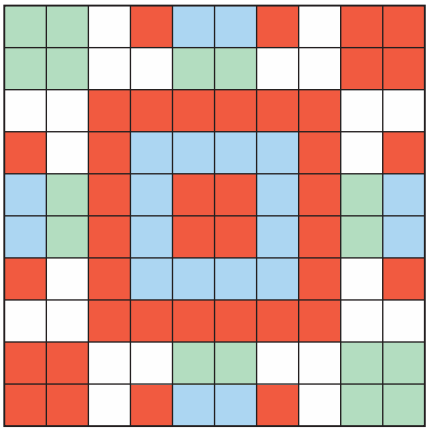
LESSON 8

# Relating Fractions, Decimals, and Percents

How can you describe each part of this design?



## Explore

You will need a 10-cm by 10-cm grid.

➤ Make a design on the grid.
Your design must follow these guidelines:
- The design must use only 4 colours:
  - orange
  - blue
  - green
  - red
- At least $\frac{7}{10}$ of the squares must be coloured.
- At least 4% of the squares must be coloured blue.
- No more than 8% of the squares can be coloured orange.
- At least 0.5 of the squares must be coloured green or red.

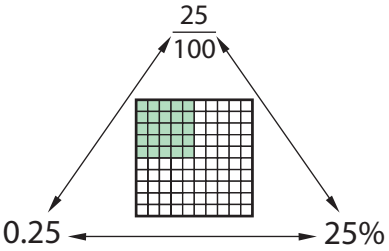
➤ Describe each colour of your design as a fraction, a decimal, and a percent.


## Show *and* Share

Share your design with another pair of students.
How are your designs alike? How are they different?
What is the greatest percent of blank squares you could have in your design? Explain.

## Connect

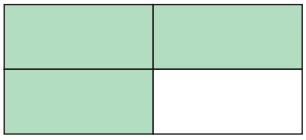
➤ Fractions, decimals, and percents are 3 ways to describe parts of one whole.




A fraction can be written as a decimal or a percent.
A decimal can be written as a fraction or a percent.
A percent can be written as a fraction or a decimal.

You can use a percent to describe any part of one whole.
1 whole = 100%

➤ What percent of this shape is shaded?



$\frac{3}{4}$ of the shape is shaded.

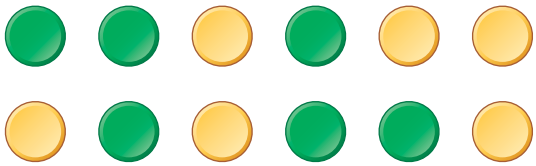
Think: Percent means "out of 100," so we need to write an equivalent fraction with hundredths.

$\frac{3}{4} = \frac{75}{100} = 75\%$ (×25 / ×25)

$\frac{75}{100}$ is the same as 0.75. So, 0.75 of the shape is shaded.

75% of the shape is shaded.

➤ What percent of this set of counters are yellow?



$\frac{6}{12}$ of the counters are yellow.
$\frac{6}{12} = \frac{1}{2}$
And, $\frac{1}{2} = 0.50 = 50\%$
50% of the counters are yellow.

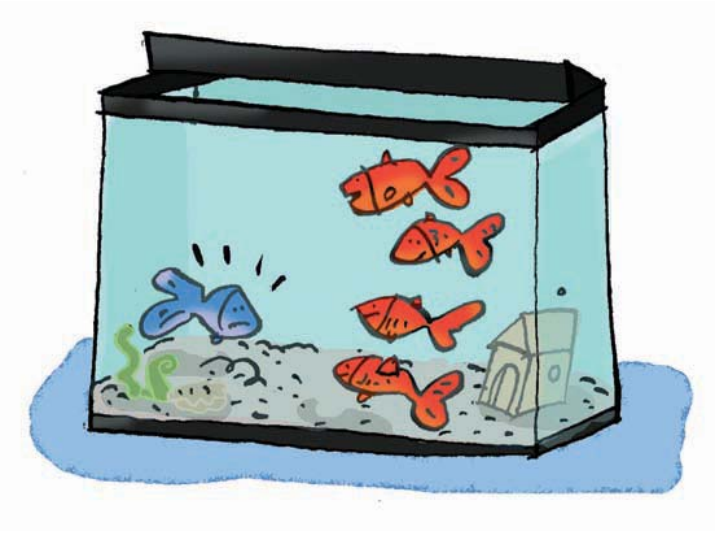
➤ A fish tank contains rainbow fish and goldfish.
The ratio of rainbow fish to goldfish in the tank is 1 : 4.
What percent of the fish are rainbow fish?

1 out of 5 fish are rainbow fish.

$\frac{1}{5} = 0.20$

And, $0.20 = 20\%$

20% of the fish are rainbow fish.



## Practice

**1.** Draw Base Ten Blocks or shade a hundredths grid to represent each fraction.
Write each fraction as a percent and as a decimal.

**a)** $\frac{6}{100}$ **b)** $\frac{81}{100}$ **c)** $\frac{17}{50}$ **d)** $\frac{3}{10}$

**e)** $\frac{1}{50}$ **f)** $\frac{1}{5}$ **g)** $\frac{7}{20}$ **h)** $\frac{3}{4}$

**2.** Draw Base Ten Blocks or shade a hundredths grid to represent each decimal.
Write each decimal as a fraction and as a percent.

**a)** 0.97 **b)** 0.03 **c)** 0.16 **d)** 0.5

**e)** 0.65 **f)** 0.24 **g)** 0.09 **h)** 0.7

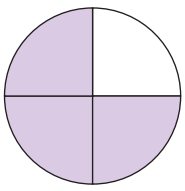
**3.** Draw Base Ten Blocks or shade a hundredths grid to represent each percent.
Write each percent as a fraction and as a decimal.

**a)** 14% **b)** 99% **c)** 25% **d)** 40%

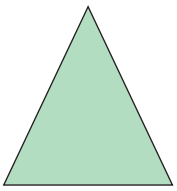
**e)** 35% **f)** 6% **g)** 90% **h)** 15%

**4.** What percent of each whole is shaded?
Show how you found your answers.

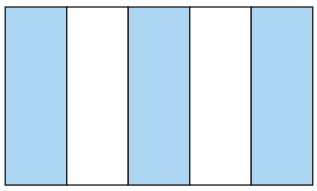
**a)**



**b)**

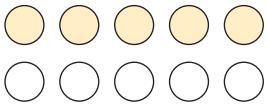


**c)**

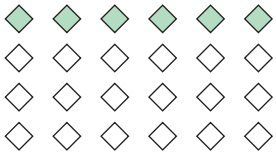


**5.** What percent of each set is shaded?
Show how you found your answers.

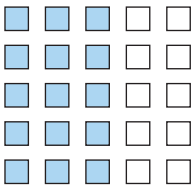
**a)**



**b)**



**c)**



**6.** Is each fraction greater than or less than 50%?
Explain how you know.

**a)** $\frac{7}{10}$ **b)** $\frac{3}{4}$ **c)** $\frac{11}{25}$ **d)** $\frac{6}{6}$

**7.** Luis used a calculator to find a decimal and a percent equal to $\frac{1}{4}$.
How might Luis have done this?

**8.** Use the data in the table. Is each statement true or false?
Explain how you know.

**a)** More than 50% of the audience were adults or seniors.
**b)** Of the audience, $\frac{58}{100}$ were children or teens.
**c)** More than $\frac{1}{4}$ of the audience were adults.
**d)** Less than 0.5 of the audience were teens or adults.

**Members of the Audience**

| Age Group | Percent |
|---|---|
| Children | 13% |
| Teens | 45% |
| Adults | 34% |
| Seniors | 8% |

**9.** Which is least? Which is greatest?
How do you know?

10% $\frac{1}{10}$ 0.01

**10.** Ravi got 18 out of 20 on a math quiz.
Karli got 85% on the quiz.
Whose mark was greater? How do you know?


**11.** Write a percent that represents:

**a)** a very little of something
**b)** almost all of something
**c)** a little more than $\frac{3}{4}$ of something
**d)** between 0.25 and 0.50 of something

How did you choose each percent?

## Reflect

How are fractions, decimals, and percents alike?
How are they different?
Use examples in your explanations.